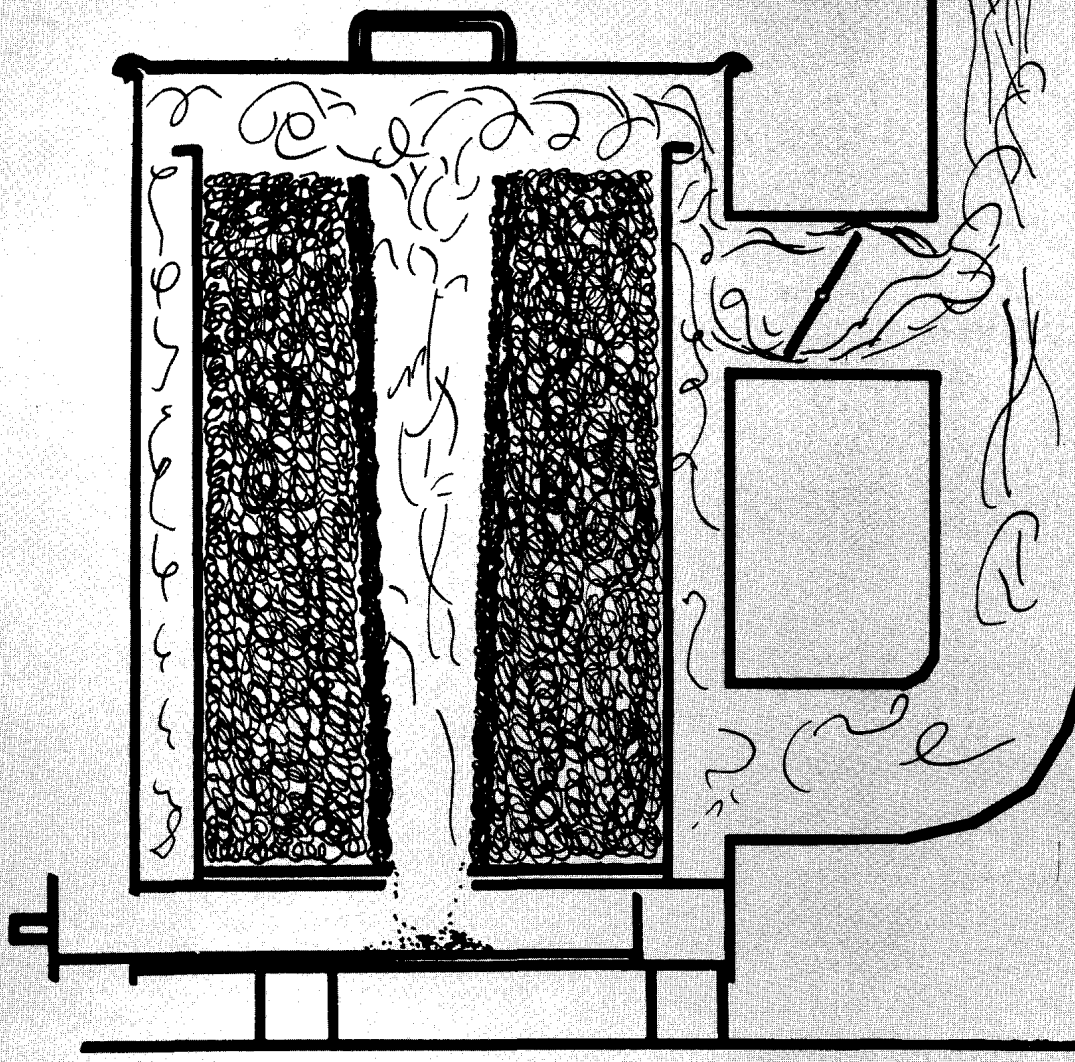
SAWDUST STOVE

A Natural for Heating Cabins and Cutting Fuel Costs

photo story no. 30

FORESTRY SCIENCE PHOTO STORY



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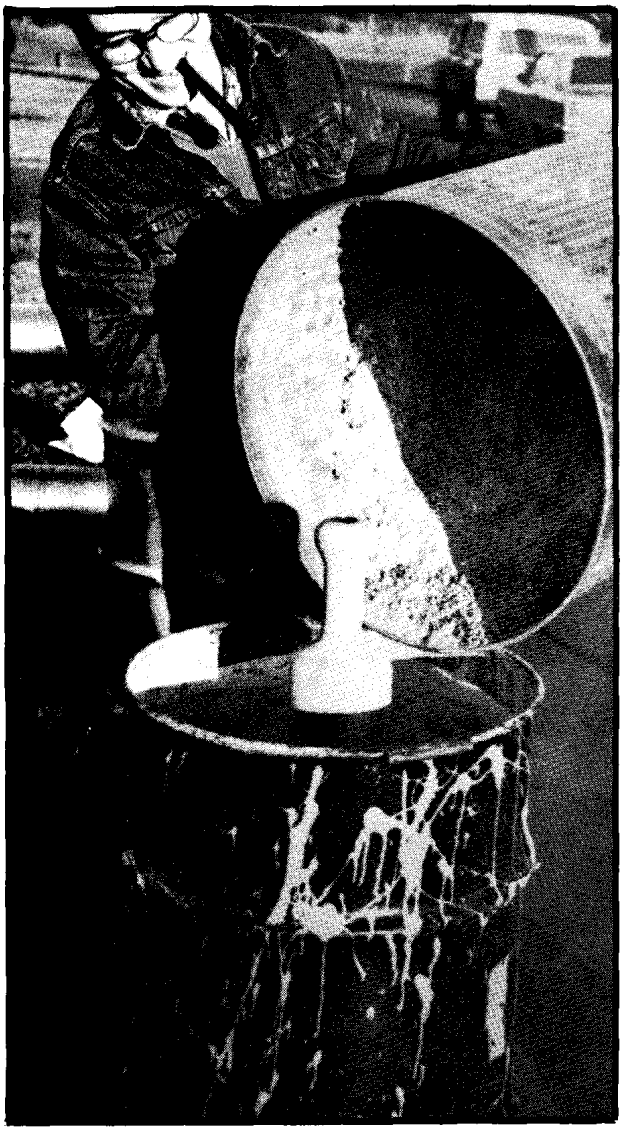
With today's Energy Crisis on everyone's mind, new sources of fuel for heating, and ways to cut heating costs, are becoming increasingly important.

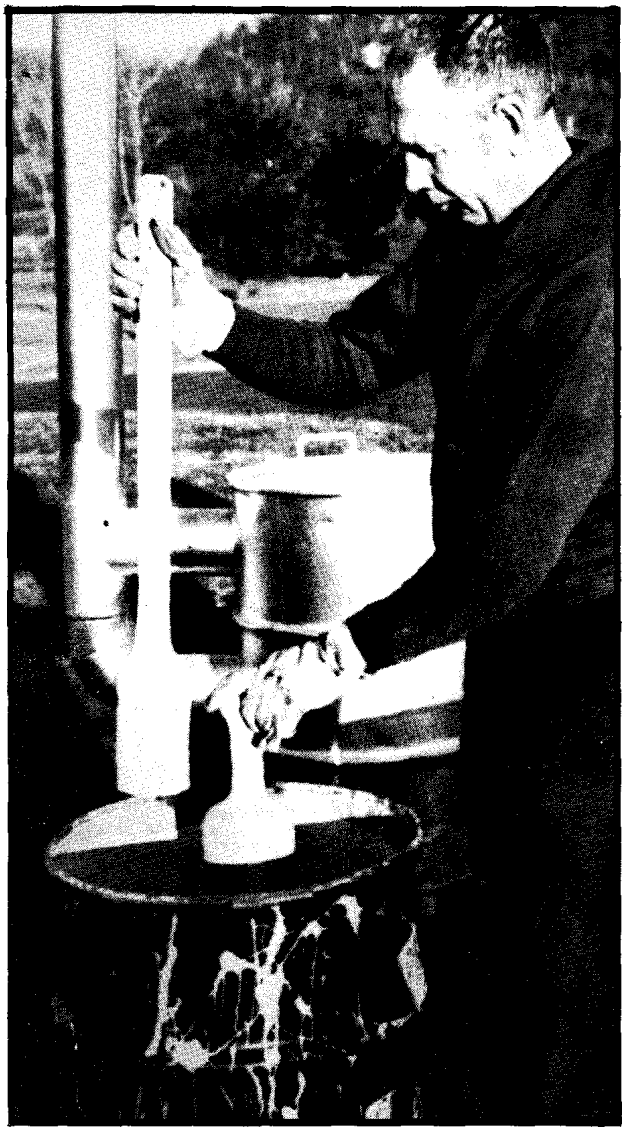
For the energy-conscious and economy-minded, sawdust can be one excellent source of heating fuel. One Forest Service employee urges the use of a stove and sawdust-fuel system that can provide enough energy to heat a cabin or workshop adequately.

The sawdust-burning stove is not a new idea. It is used to heat dwellings in many underdeveloped parts of the world, including Asia and South America.

Sawdust is a readily available fuel throughout the United States. Mountains of it are produced and generally discarded by sawmills each day. As a heating fuel



Filling the inner barrell with sawdust. Note the wooden insert in the center.



To pack sawdust in the barrel tightly enough, it should be tamped down.

it would be quite inexpensive to obtain. Bark, another residue at many sawmills, can be used as an alternate fuel. For most efficient heating, the moisture content of both these materials should be below 60%.

The stove that has been tested by Forest Service Market Analyst Jeffrey L. Wartluft of the Forest Products Marketing Laboratory in Princeton, W. Va., is likewise inexpensive to construct. The test stove was made with about $25 worth of materials and simple tinsmith's tools. In this stove, one charge of sawdust can

burn unattended for 6 to 10 hours, depending on the moisture content of the sawdust and on draft conditions. The drier the sawdust, the greater the heat given off. At best, it can generate enough heat for a 20 X 20 foot room.

The stove is basically two steel drums - a 55-gallon drum and a 30-gallon drum - set one inside the other. A false floor inside the outer barrel supports the inner barrell above a drawer, which serves as a draft to let air in and also catches ashes for easy removal. In the center of the false floor and in the bottom of the inner barrel are 3-inch holes that permit air to pass up to the fire. A tightly-fitting, removable lid covers the outer barrel, while leaving several inches clearance at the

Once filled with fuel, the stove is ready to be lidded and ignited.

top of the inner barrel.

The outer barrel sits up on three legs, which keep heat from the floor and prevent rocking. A stove pipe for exhausting smoke is also attached to the outer barrel.

The drawer and false bottom of the 55-gallon outer drum are made of 20-gauge sheet metal. This false bottom is supported by two 1/2-inch steel rods that run through holes in opposite sides of the outer barrel, where they are brazed. Handles brazed onto the lid and drawer of the outer barrel and to the top of the inner barrel are of the same type rods. And the drawer tabs and curved front are fastened by either pop rivets or brazing.

Two 6-inch horizontal stove pipes lead from the outer barrel to join a single 6-inch vertical pipe. One horizontal pipe leads from the top of the barrel, while the other leads from the area immediately above the false floor. The vertical pipe can be fitted with elbows, straight lengths, and a ventilation cap to suit the individual installation. The damper is located in the upper horizontal pipe.

Stoves of other sizes might be fabricated from heavy gauge sheet metal - about 14 gauge.

In preparing the test stove for operation, a round wooden insert is first placed upright in the center of the smaller barrel. The hole at the bottom of the barrel holds it in place. This insert is made of turned wood. At the top, below its narrow handle, it is five inches in diameter, and it tapers evenly to three inches in diameter at the bottom.

When the insert is in place, sawdust can be packed into the container around the insert. Dry sawdust will require more tamping than wet sawdust. After packing, the wooden insert is removed carefully, leaving an open column in the middle of the sawdust. This open space acts like a chimney when the stove is lit and burning.

In lighting the stove, both damper and drawer should be opened to create a full draft. Crumpled paper is dropped into the open column, then the lid of the outer barrel is put on securely. Next a lighted piece of crumpled paper is inserted into the lower drawer. This will ignite the other paper in the column adjacent to the sawdust fuel and will start the sawdust burning. With dry sawdust, paper from a large grocery bag is adequate to start the stove burning. With wetter material, more paper is needed.

Once the fuel is burning, the drawer and damper can be adjusted to control the speed of burning and, in turn, the amount of heat produced. Closing the damper forces hot air to circulate lower in the barrel and causes more heat to transfer to the room. Any excess heat leaves with the exhaust through the stove pipe.

For safety, the stove should be placed at least 24 inches away from any combustible wall or floor material. A wall thimble or triple wall pipe should be used where the pipe goes through the wall or roof to the outside. Before lighting, the lid must be fixed firmly on the stove. And since the stove burns hot enough to boil water, its surfaces should not be touched by skin or clothing. Adequate ventilation, as with all stoves, is a must to prevent possible accumulation of carbon monoxide.

The sawdust stove has a major limiting factor: the moisture content of the sawdust. The fuel should have a moisture content below 60%. Sawdust and bark fresh from the sawmill can have moisture contents anywhere from 50 to 110%. The best sources of sawdust are at the many plants and retail lumber yards that cut dry wood. While fuels exceeding 100% moisture content on an oven-dry basis will burn, most of their heat is used to drive off moisture and will, therefore, not be available to heat the room.

Sawdust and other wood residues are, indeed, excellent, but generally overlooked, sources of heating fuel. With this relatively simple system, they could be used to meet the needs of certain heating situations and could help to ease the strain on both energy supplies and pocketbooks.

Lighted paper is inserted into the drawer to ignite the sawdust stove.